

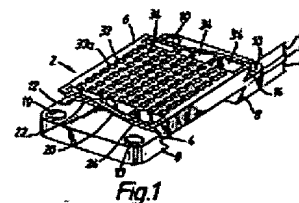
Spacers for spacing e.g. building fittings from surrounding structure

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Re

Abstract of GB2283995

A spacer block 2 has a planar spacing portion 4 on opposite sides of which are complementary male and female dovetail portions 6 and 8. Like spacer blocks 2 can be reversibly interlocked to form a spacer the height of which is dependent on the number of spacer blocks 2 that are stacked together. Cavities 32, 34 and 36 provide internal regions of reduced hardness to the spacer so formed so that self-tapping screws can be easily used to attach fillings to it. In use, a first spacer block 2 is fixed to a substrate by means of screws through through-holes 10 after which the further spacer blocks are concatenated as desired. The spacer blocks 2 permit the ready formation of a spacer of desired height without the need for cutting wood spacers to size.



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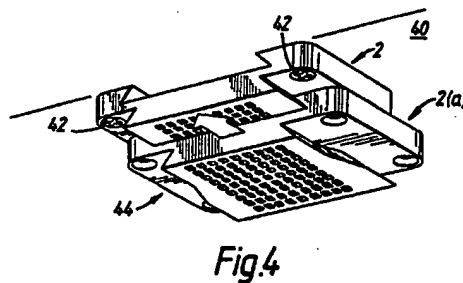
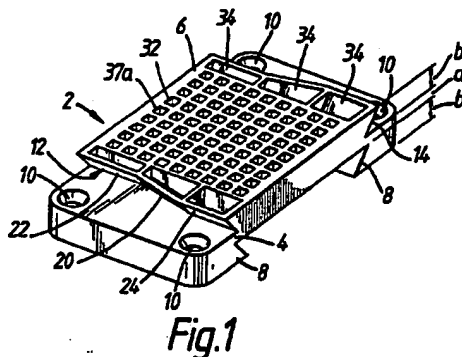
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(54) Spacers for spacing e.g. building fittings from surrounding structure

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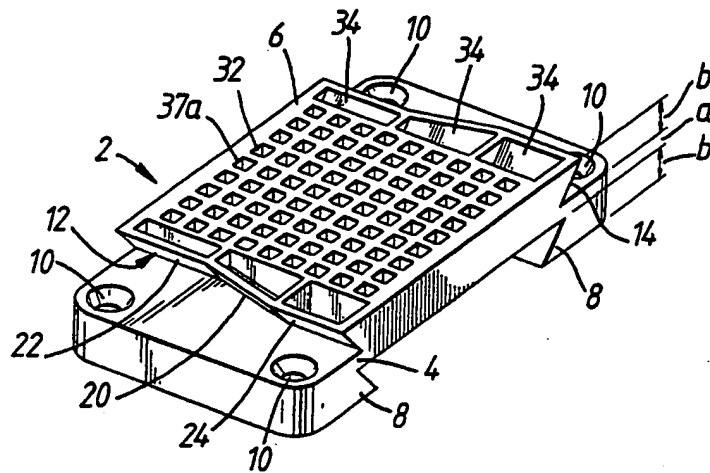


Fig. 1

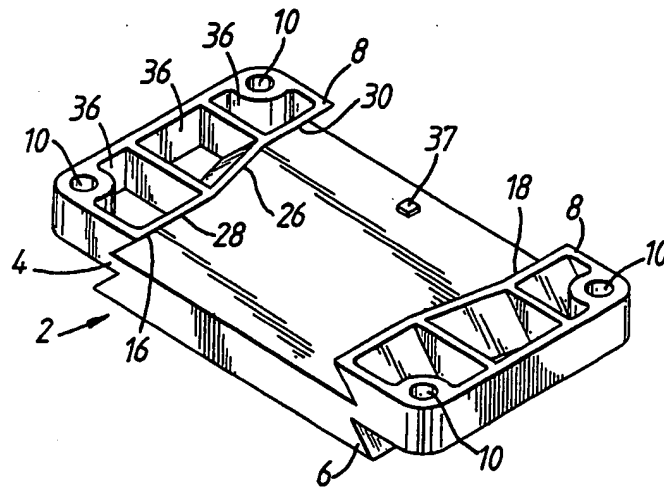


Fig. 2

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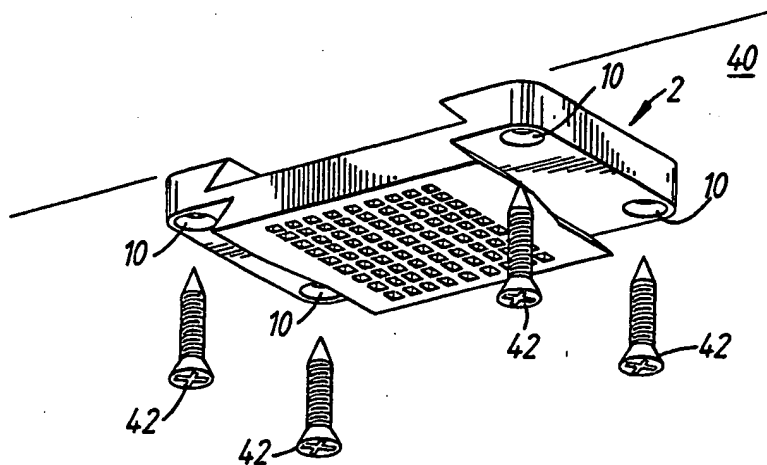


Fig. 3

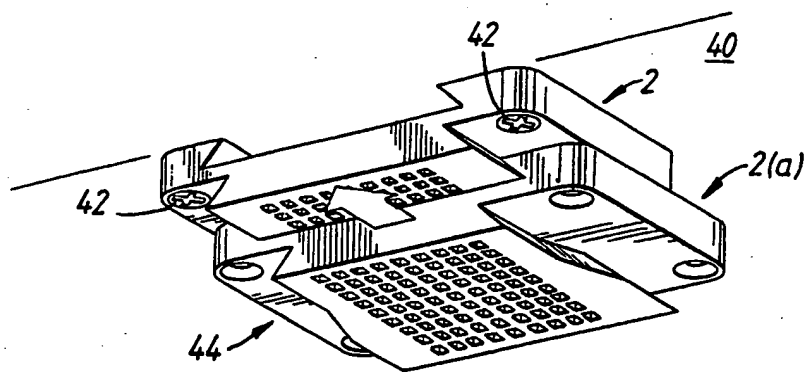


Fig. 4

A SPACER

This invention relates to spacers and finds
5 particular, but not exclusive, application in locating
building construction fittings within spaces of greater
dimensions than themselves.

One such application is in the fitting of sliding
wardrobe doors between a floor and a ceiling by fixing a
10 top track to support the top of the doors and end jambs to
limit their sideways range of movement. The doors are
generally manufactured to one or more specific dimensions
and a set is selected that will fit within the dimensions
of the desired location of the wardrobe. The top track and
15 end jambs generally have to be supported some distance down
from the ceiling and in from the side walls.

A current method of providing the necessary support is
to attach wood spacers at various points along the ceiling
and walls by means of screws, for example, through their
20 whole depth and to screw the required top track and end
jambs to their inward facing surfaces. The gaps to the
tops and sides if present are usually covered by a set of
facia panels cut to size and screwed to the wood spacers.

The same fixing techniques are used in other areas of
25 building construction, for example fixing a door frame

within a hole in a wall.

There are drawbacks associated with these spacers. It is time consuming to cut each wood block to the correct size. More particularly, if the space to be bridged is
5 large it is necessary to use correspondingly large screws to fix the block to the building's ceiling or walls or to drill a deep countersunk hole.

According to a first aspect the present invention there is provided a spacer comprising a stack of a
10 plurality of spacer blocks each of which has interlocking means by which each spacer block is reversibly interlockable with an adjacent spacer block at least one support block being able to accept a mechanical fixing passing through the block for fixing the spacer block to a
15 substrate.

Because the spacer is formed from a number of reversibly interlocking spacer blocks one can readily add or remove spacer blocks to obtain a spacer of the required height for the application at hand. The spacer can be
20 formed in situ by fixing a first spacer block to a ceiling, for example, by a mechanical fixing such as a screw or nail then adding further spacer blocks until a spacer of the required size has been formed. If the spacer is of a relatively hard material the spacer blocks preferably
25 include internal regions of lower hardness to ease

penetration of the spacer by self-tapping screws. Such
spacers can be used in the same manner as a prior art wood
spacer as regards fixing items to it. Thus, for example,
facia panels can be readily fixed to the spacer of the
5 present invention. The regions of lower hardness in such
spacers are conveniently formed by air-filled cavities.

Such regions of lower hardness will not be needed if
the spacer blocks are made of a less hard material.

Because a relatively large spacer is built up from a
10 first single, relatively thin spacer block, only relatively
small length screws or other mechanical fixing are needed
to fix the spacer to a substrate, namely the length of
screw needed to fix the first spacer block.

The present invention in a further aspect is a spacer
15 block for forming the spacer according to the first aspect
of the present invention having a generally planar spacing
portion with the interlocking means comprising first and
second interlocking portions disposed on opposite sides of
the spacing portion. This provides a relatively large area
20 in contact with the substrate to which the spacer is to be
attached compared to the smallest increment in size
available to the spacer.

The preferred form of spacer block is one in which the
interlocking portions are each either a male dovetail
25 portion or a female dovetail portion. This provides the

ready manual addition or removal of spacer blocks during formation of the spacer. By suitable orientation of the initial spacer block, the expected direction of the highest forces to be applied via the fixture to the spacer can be
5 directed across the dovetail joint and so will not act to displace any spacer block relative to another.

A number, if not all, of the spacer blocks will generally also be fixed relative to each other by the screws attaching the fixture to the spacer.

10 A particular spacer block could be provided with a pair of male interlocking portions or a pair of female interlocking portions. In this case a spacer would be constructed using alternate types of two spacers. It is far preferable, however, to provide each spacer with a male
15 and a female interlocking portion, and in particular dovetail joint portions in which the first interlocking portion is a male dovetail joint portion and the second interlocking portion is a female dovetail joint portion, whereby a spacer can be formed from interlocking like
20 spacer blocks of a single design.

In spacer blocks of the present invention using a dovetail joint interlock, the male dovetail portion can be formed with an array of cavities or holes, somewhat like a honeycomb structure, to provide relatively easy entry to a
25 self-tapping screw. The edges of the female portion are

preferably largely hollow, again to provide relatively thin walls of high hardness to allow easy entry by a self-tapping screw.

The preferred form of dovetail joint is one which has
5 at least one wedge-shaped portion. This has the advantage of providing a stop when two spacer blocks are pushed into interlocking engagement. A more positive and precise stop is achievable if the wedge is steep. This is conveniently obtained by providing a wedge-shaped portion to the
10 dovetail joint bounded by a pair of parallel sided portions.

If the wedge portion is steepened sufficiently one would have an abutting portion within the dovetail but this does not form as secure a fit laterally between spacer
15 blocks.

The spacer block is conveniently made from a plastics material such as polyethelene, polyurathane, nylon or, preferably, polypropylene. If high strength is a major consideration ABS plastics could be used.

20 The preferred technique for the manufacture of a plastics spacer block is injection moulding. In this
X case, to ease ejection from the mould, a spacer block having male and female dovetail portions has the male and female dovetail portions aligned on each side of the
25 spacing portion with the broader end of the female dovetail

portion opposite the narrower end of the male dovetail portion.

Whilst it is envisaged that for most applications a single thickness of spacer block will provide an adequate
5 range of sizes of spacer, if a large spacer is required it would be more convenient to provide a number of types of spacers with different thicknesses of spacing portions. A large spacer could then be largely formed with a small number of thicker spacer blocks, with a small number of
10 thinner spacer blocks to provide a relatively fine adjustment to the final spacer height.

The present invention in a yet further aspect encompasses a kit of such spacer blocks having two or more different thicknesses of spacing portion.

15 An embodiment of the present invention will now be described, by way of example only, with reference to accompanying drawings of which

Figure 1 is a perspective view of a spacer block according to the present invention:

20 Figure 2 is a part-transparent perspective view of the underside of the spacer block of Figure 1;

Figure 3 is a perspective exploded view of the spacer block fixed to a ceiling; and

Figure 4 is a perspective view of a second spacer
25 block being interlocked with the spacer block of Figure 3

to form a spacer according to the present invention.

Referring to Figures 1 and 2, a spacer block 2 is a unitary, injection moulded block of polypropylene which has a generally planar spacing portion 4 with interlocking means in the form of male and female dovetail joint portions 6 and 8, respectively, on opposite sides of the spacing portion 4. The male and female dovetails 6 and 8 are dimensioned to interlock with the female and male dovetail portions of a like spacer block so that a spacer can be formed by interlocking a number of spacer blocks 2.

The spacing portion in this embodiment is 3mm thick (distance a in Figure 1) and the male and female dovetail joint portions are each 6mm thick (distances b in Figure 1).

Four countersunk through-holes 10 are provided at the corners of the block 2 to allow ready fixing of the block 2 to a suitable substrate by means of screws (see Figure 3).

Referring particularly to Figure 1, the male dovetail portion 6 has opposed side surfaces 12 and 14 which interlock with complementary side surfaces 16 and 18 of a female dovetail portion 8 to form a dovetail joint when pushed in direction A, the orientation of the joint (see Figure 4), into interlocking relationship.

The sides 12 and 14 of the male dovetail portion are

each of three sections, namely a planar section 20 in a plane inclined relative to the direction A positioned between a pair of planar sections 22 and 24 in planes parallel to the direction A.

5 The sides 16 and 18 of the female dovetail joint portion 8 have similarly oriented planar sections 26, 28 and 30 corresponding to planar sections 20, 22 and 24 of the complementary male dovetail joint portion. The planar sections 22, 24, 28 and 30 are inclined at 45° to the plane
10 of the spacing portion 4.

The dovetail joint produced by mating the male and female joint portions 6 and 8 is stepped with a wedge shaped central portion bounded by a narrow and a wide parallel sided portion.

15 The planar sections 20 and 26 of the male and female joint portions (defining the central wedge shaped central portion) provide a stop to provide ready alignment of a stack of like support blocks 2 to provide planar surfaces normal to the plane of the spacing portion 4 and so a
20 generally cuboidal spacer.

In this embodiment lower hardness regions of the spacer are provided by cavities formed in the support block 2 to allow easy penetration of self-tapping screws so that a spacer formed from a stack of spacer blocks 2 can be used
25 in broadly the same fashion as a wood block for fixing

attachments to it. The cavities are in the form of a number of cuboidal hollows 32 formed as an array in the body of the male dovetail joint portion 60. Self-tapping screws can thus be more easily be screwed into the male dovetail portion 6 either parallel or perpendicular to the plane of the spacing portion 4.

Larger cavities 34 are provided behind the sides 20, 22 and 24 of the male dovetail portion 6 to similarly allow ease of penetration by screws. Similarly, cavities 6 are formed behind the surfaces 26, 28 and 30 of the female dovetail's joint portion 8.

The precise number, size and form of the cavities is arbitrary and can be readily selected according to the size of the spacer block 2, the hardness of the material from which it is made, its likely use, and so on.

Referring to Figure 2, a pip 37 on the spacing portion 4 between the female dovetail joint portions 8 is sized and located to engage with the cavity 37a to provide positive location of the two interlocked spacer blocks 2 in their fully aligned position.

The support block could be also formed from a foamed plastics material where internal regions of lower hardness than the outer surface of the support block would be formed directly as part of the manufacturing process of a solid spacer block according to the present invention.

The use of the spacer block 2 to form a spacer according to the present invention will now be described with reference to Figures 3 and 4.

As shown in Figure 3, the spacer block 2 is fixed to
5 a ceiling or other substrate by four screws 42 through the through-holes 10 in the spacer block 2. A spacer 44 can then be formed by forming a stack of interlocking similar spacer blocks (e.g. spacer block 2a) by manually pushing the dovetail joints together by pushing the further spacer
10 block 2a in direction A. Only two are shown in Figure 4.

The spacer 44 can be built up to the desired height by adding further spacer blocks 2, each interlocking with the one previously added. The dovetail joint is reversibly interlocking so the spacer 44 can be reduced in height if
15 inadvertently made too high.

CLAIMS

1. A spacer comprising a stack of a plurality of spacer blocks each of which has interlocking means by which
5 each spacer block is reversibly interlockable with an adjacent spacer block at least one support block being able to accept a mechanical fixing passing through the block for fixing the spacer block to a substrate.

2. A spacer as claimed in claim 1 having internal
10 air filled cavities.

3. A spacer block for use in forming a spacer as claimed in either one of claims 1 and 2 having a generally planar spacing portion with the interlocking means comprising first and second interlocking portions disposed
15 on opposite sides of the spacing portion.

4. A spacer block as claimed in any preceding claim in which the interlocking portions are each either a male dovetail joint portion or a female dovetail joint portion.

5. A spacer block as claimed in claim 4 in which the
20 first interlocking portion is a male dovetail joint portion and the second interlocking portion is a female dovetail joint portion complementary to the male dovetail joint portion, whereby a spacer can be formed from interlocking like spacer blocks.

25 6. A spacer block as claimed in either one of claims

4 and 5 in which the male dovetail joint portion includes an array of cavities.

7. A spacer block as claimed in any one of claims 4 to 6 in which those portions of the spacer block defining the female dovetail joint portion include one or more cavities.

8. A spacer block as claimed in any one of claims 4 to 7 in which the male and female dovetail joint portions are interlockable with complementary dovetail portions to form dovetail joints having at least one wedge shaped portion.

9. A spacer block as claimed in claim 8 in which the dovetail joint includes a wedge shaped portion bounded by a pair of parallel sided portions.

10. A spacer block as claimed in any one of claims 3 to 9 in which the spacer block includes at least one through-hole whereby the spacer block is attachable to a substrate by a mechanical fixing means.

11. A spacer block as claimed in any one of claims 8 to 10 in which the male and female dovetail portions are aligned on each side of the spacing portion with the broader end of the female dovetail portion opposite the narrower end of the male dovetail portion.

12. A spacer block as claimed in any one of claims 3 to 11 and which is made of polypropylene.

13. A set of a plurality of spacer blocks each spacer block being as claimed in any one of claims 3 to 12 in which at least two of the spacer blocks have spacing portions of different thickness.

5 14. A spacer block substantially as hereinbefore described with reference to the accompanying drawings.

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Patents Act 1977
Examiner's report to the Comptroller under Section 17
(The Search report)

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Relevant Technical Fields

(i) UK Cl (Ed.M) E1D (DF146, DF172, DF178) E1J (JG8) F2H
 (HAV, HAW, HAX, HAY, HG, HL)

(ii) Int Cl (Ed.5) E04B, E06B, F16B

Search Examiner
 D J LOVELL

Date of completion of Search
 28.2.94

Databases (see below)

(i) UK Patent Office collections of GB, EP, WO and US patent specifications.

(ii)

Documents considered relevant following a search in respect of Claims :-
 1-14

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